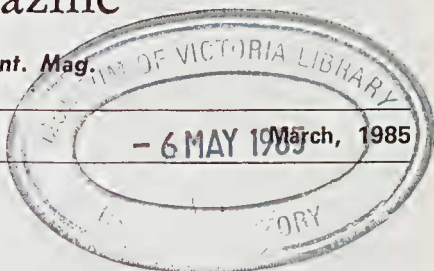


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BUTTERFLIES (LEPIDOPTERA: HESPERIOIDEA, PAPILIONOIDEA) OF KANGAROO ISLAND, SOUTH AUSTRALIA

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Abstract

The known butterfly fauna of Kangaroo Island is recorded. The environment is discussed insofar as it relates to butterfly habitats and their larval food plants. Attention is drawn to the extensive areas of unspoiled native bushland which remain on the island and the extent to which these have been reserved as conservation parks and a national park, and the unique opportunity these offer for further faunistic and floristic studies.

Introduction

With an area of some 4250 sq km Kangaroo Island ranks second to Tasmania in the size of Australia's offshore islands. The first reference to a butterfly from this island is that of the French explorers Peron and Freycinet (1816) who included "une espece de papillon de la division des Brassicaires de M. Latreille" in their list of entomological collections. A further reference to Kangaroo Island is made in the distribution data of one species by Tepper (1882). Subsequently Fisher (1978) included the island in the distribution of 10 species, and drew attention to the paucity of material available. Most of these records were from material in the South Australian Museum and the Australian National Insect Collection, Canberra, collected largely by the late F. M. Angel and F. E. Parsons prior to 1955, and from limited material in the Museum of Victoria, Melbourne and the Australian Museum, Sydney.

Following field work in 1981 and 1982 and examination of the collection of J. A. Bonnin this list is now extended to 24 species and an additional subspecies. *Geitoneura acantha ocrea* (Guest) has not been included although its distribution given in Common and Waterhouse (1972) includes Kangaroo Island. The original source of this record has not been located (I. F. B. Common, pers. comm.) and there was no relevant material in any of the institutional or private collections examined.

As a result of the very limited degree to which serious field work has been carried out on the island the records of several species are confined to

single specimens. In the species list which follows the probable abundance of these is projected, taking into account the known abundance of their larval food plants. Further field work may extend the list of species given here.

Environment and habitats

Kangaroo Island measures approximately 140 km from west to east and about 55 km at its widest point (Fig. 1). At its eastern end it lies some 13 km from Fleurieu Peninsula on the South Australian mainland; isolation from the mainland by rising sea levels probably occurred about 9500 years ago (Lampert, 1979). Its climate is temperate and mild; its average annual rainfall is estimated in the absence of long-term records to vary over the island from 500 mm to 900 mm (Burrows, 1979). Its topography for the most part is gently undulating, with the highest point less than 300 m above sea level.

The vegetation of the island is difficult, if not impossible, to describe briefly because of its many complex and often puzzling characteristics (Lange, 1979). Broadly, there are a number of mallee-type associations, with considerable variations between dense, low scrub, dominated by *Eucalyptus* spp. and inhabited by few butterflies, and more open areas of heath and sometimes savannah. It is in these open areas and on the edges of the dense scrub that most butterfly species have been recorded. At the western, wetter end there are open forest and low open forest formations with *Eucalyptus* spp. reaching a height of 30 m, and with some understorey of sclerophyllous heath species (Specht, 1972). Here, too, are several perennial creeks, often heavily overgrown with *Pteridium esculentum* (Forster f.) Nakai (bracken) interspersed with *Gahnia* spp. and providing typical habitats for some hesperiid butterflies (Fig. 2). Coastal formations are diverse but rather similar to some mainland coastal areas in South Australia. Included in these communities are a number of species which serve as food for the larvae of some butterflies. Coastal clifftops often support fairly dense formations of mat plants and low shrubs but few butterflies are found in these areas.

Both *Gahnia trifida* Labill. and *G. sieberiana* Kunth occur widely, particularly at the edges of the many brackish and freshwater lagoons that occur throughout the island. *G. clarkei* Benl is less common. *G. deusta* (R. Br.) Benth. has a restricted distribution, occurring mainly near parts of the southern coast; [*G. filum* (Labill.) F. Muell. is referred to by Wood (1930) but the occurrence of this species requires confirmation]. Four species of hesperiids, *Hesperilla idothea clara*, *H. donnysa delos*, *H. chrysotricha leucosia* and *Motasingha a. atralba*, and one additional subspecies, *H. d. diluta*, have been recorded from these plants. A dwarf endemic species, *Gahnia hystrix* J. Black, is found in some localities but there is no evidence to suggest that this is a larval food plant of a butterfly. Some common larval food plants are notably absent from the island's flora. Mistletoes, widely distributed over



Fig. 1. Kangaroo Island, showing major areas of conservation. 1: Flinders Chase National Park. 2-9: Cape Torrens, Western River, Kelly Hill, Vivonne Bay, Seal Bay, Cape Gantheaume, Dudley and Cape Hart Conservation Parks.



Fig. 2. *Gahnia sieberiana* (centre), larval food plant of *Hesperilla idothea clara*, *H. donnysa delos* and *H. chrysotricha leucosia*, in dense understory at Breakneck River, Flinders Chase.

much of mainland South Australia, are represented by one infrequent species, *Amyema melaleucae* (Miq.) Tieghem. *Gahnia lanigera* (R. Br.) Benth., widespread in southern South Australia, is absent. The family Asclepiadaceae is not represented although the introduced *Asclepias rotundifolia* Miller (cotton bush) is well established on the nearby coast of Fleurieu Peninsula. The genus *Cassia* is not recorded.

Intensive development of the island for farming began less than 40 years ago. Since then large areas of natural vegetation have been replaced by pastures, particularly in the central western areas and on Dudley Peninsula. There remain considerable tracts of native scrub along roadsides, and sixteen areas, representing more than one-fifth of the total land surface, have been reserved as conservation parks. The largest of these, Flinders Chase National Park, has an area of some 59,000 ha and extends over much of the western end. Corridors of native bushland are also being preserved in perpetuity under Vegetation Heritage Agreements between the State Government and Land-owners. There are no rabbits on the island. There is evidence that burning by extensive natural fires has occurred occasionally before European occupation, but burning by aboriginal man ceased about 2000 years ago, at the end of his occupation of the island (Lampert, 1979).

Here, then, is a substantial area with a high degree of conservation, at least by mainland standards, and with tracts of native vegetation which have been influenced little by man until quite recently. It provides an admirable resource for continuing faunistic (and floristic) studies, and the survival of most of its butterfly species seems reasonably assured.

Species list

Species are arranged in families and follow the sequence given in Common and Waterhouse (1981).

HESPERIIDAE

Hesperilla idothea clara Waterhouse, 1932. Two specimens were reared from a larva and pupa taken from *Gahnia sieberiana* at Breakneck River, Flinders Chase. These specimens emerged in November and January.

Hesperilla donnyisa delos Waterhouse, 1941. Widely distributed from Flinders Chase to American River. Larvae occur with those of *H. chrysostricha leucosia* on *Gahnia sieberiana* and *G. trifida*. Adults have been collected in November and December.

Hesperilla donnyisa diluta Waterhouse, 1932. This subspecies is recorded from Seal Bay Conservation Park, where its larvae feed on *Gahnia deusta* with those of *Motasingha a. atralba*. All specimens were collected in November.

Hesperilla chrysostricha leucosia Waterhouse, 1938. This species is widely distributed. It is recorded from Flinders Chase and American River, and from many localities between. Its larval food plants, *Gahnia sieberiana* and *G. trifida*, occur frequently in roadside vegetation and in swampy areas. Adults appear mainly in October and November. Specimens in the South Australian Museum have been identified by L. Couchman as



Fig.3. Habitat of *Motasingha a. atralba* and *Hesperilla donnyssa diluta*, with the larval food plant, *Gahnia dausta*, in foreground. Seal Bay Conservation Park.



Fig.4. *Choretrum glomeratum* (left), larval food plant of *Ogyris otares*, in a typical habitat of this butterfly, Dudley Conservation Park.

subspecies *naua* Couchman, 1949, described originally from Eyre Peninsula, but with longer series of specimens available for examination there is no evidence to support this. Kangaroo Island specimens are placed here therefore in subspecies *leucosia*, which occurs also on nearby Fleurieu Peninsula.

Motasingha dirphia trimaculata (Tepper), 1882. A single specimen taken from Rocky River, Flinders Chase, in December. The species' mainland larval food plants, *Lepidosperma carphoides* F. Muell. ex Benth. and *L. viscidum* R. Br. occur widely on the island.

Motasingha atralba atralba (Tepper), 1882. Taken from Seal Bay Conservation Park in November, where larvae feed on *Gahnia deusta*. There is no evidence of an autumn brood on Kangaroo Island although both spring and autumn emergences occur in many mainland localities. A typical habitat is shown in Fig. 3.

PIERIDAE

Eurema smilax (Donovan), 1805. A single specimen taken at American River in January. On the mainland the larvae feed on *Cassia* spp., which do not occur on Kangaroo Island. It may be presumed that occasional specimens will reach the island from the mainland. Migratory flights of this species are well recorded and individuals are quite capable of flying long distances.

Delias aganippe (Donovan), 1805. Tepper (1882) includes Kangaroo Island in the distribution of this species, referring probably to a specimen in the South Australian Museum labelled "Kangaroo Island, J. Wright". Possible larval food plants on the island include *Exocarpos cupressiformis* Labill. The butterfly has not been collected in recent years.

Anaphaeis java teutonia (Fabricius), 1775. Large numbers of this butterfly reach Kangaroo Island from time to time in the course of migratory flights from the north. These flights begin in the Flinders Ranges where the larval food plant, *Capparis mitchellii* Lindley, occurs, and the flights reach southern areas of the state from October to December. In October 1981 a number of specimens were observed flying south over Gulf St. Vincent and the species was widespread on the island. This could well be the species listed by Peron and Freycinet (1816), who visited the island in early January.

Pieris rapae rapae (Linnaeus), 1758. This introduced species is well established on the island. Its larvae feed on many cultivated domestic plants and possibly some native species.

NYPHALIDAE

Danaus plexippus plexippus (Linnaeus), 1758. A single specimen has been observed. The larvae feed on plants of the family Asclepiadaceae which do not occur on Kangaroo Island. However, the introduced *Asclepias rotundifolia* is common on Fleurieu Peninsula and occasional specimens of the butterfly could be expected to reach the island from the mainland.

Danaus chrysippus petilia (Stoll), 1790. One specimen has been taken at American River in January. The larvae feed on *Asclepias rotundifolia* and, with *D. p. plexippus*, it would be expected to reach the island occasionally from the mainland.

Geitoneura klugii klugii (Guerin-Meneville), 1830. This is quite common, inhabiting partly shaded grassy slopes and savannah woodlands. Larvae feed on a variety of grasses (Gramineae).

Heteronympha merope merope (Fabricius), 1775. This species is common, with similar habitats and larval food plants to those of *Geitoneura k. klugii*.

Vanessa kershawi (McCoy), 1868. Common throughout the island. Larval food plants include *Helichrysum* spp. of which seven are recorded from Kangaroo Island.

Junonia villida calybe (Godart), 1819. This species, although not commonly encountered or recorded, should occur over most of the island. Its many larval food plants include *Plantago* spp. of which four are recorded from the island.

LYCAENIDAE

Ogyris idmo halmaturia Tepper, 1890. This is a rare butterfly, known only from isolated specimens throughout most of its range. A few specimens have been collected near Kingscote and at Rocky River, usually in December. Its life history is not known, but there is some evidence that its early stages are associated with the sugar ant *Camponotus nigriceps* (Common and Waterhouse, 1981).

Ogyris otanes C. & R. Felder, 1865. Fisher (1978) describes this species as quite rare on Kangaroo Island. More recent field work indicates that it is reasonably abundant, having been collected or observed in various localities from Flinders Chase to Dudley Conservation Park. Its larval food plant, *Choretrum glomeratum* R. Br., rare now on the mainland, occurs widely along roadsides and in conservation areas. Its larvae live in association with a sugar ant, *Myrmophyma ferruginipes*, which builds a nest in sand at the base of the food plant. The life history of this species was described by Burns and Angel (1952) from material collected near Kingscote. A typical habitat is shown in Fig. 4.

Candalides acastus (Cox), 1873. Specimens have been taken in December. The larval food plants of this butterfly, twining *Cassytha* spp., occur widely on the island.

Candalides hyacinthinus simplex (Tepper), 1882. Several specimens have been taken at Ravine de Casoars in Flinders Chase. Larvae feed on *Cassytha melantha* R. Br., which is widespread, and the butterfly should be reasonably abundant from October to February.

Nacaduba biocellata biocellata (C. & R. Felder), 1865. A single specimen has been taken in April. The butterfly should be reasonably abundant during the summer months as its larval food plants, *Acacia* spp., are well represented.

Neolucia agricola agricola (Westwood), 1851. Specimens have been collected at Seal Bay Conservation Park, but the butterfly probably occurs widely as its larvae feed on the flowers of various plants of the family Leguminosae which are common on the island.

Theclinesstes albocincta (Waterhouse), 1903. Several specimens have been taken from Dudley Peninsula, in January. The larval food plant, *Adriana klotzschii* (F. Muell.) Muell.-Arg., occurs commonly in some coastal areas and the butterfly should be reasonably abundant in these localities from November to April.

Theclinesstes serpentata serpentata (Herrich-Schaffer), 1869. This is a common species, particularly in coastal areas. At D'Estrees Bay larvae feed on *Atriplex cinerea* Poirlet, and probably on other *Atriplex* spp. which occur on the island.

Zizina labradus labradus (Godart), 1824. This species is widespread and common, its larvae feeding on various plants of the family Leguminosae.

Discussion

Due to the proximity of Kangaroo Island to the mainland it is probable that four species, *Eurema smilax*, *Anaphaeis java teutonia*, *Danaus p. plexippus* and *D. chrysippus petilia*, are occasional visitors, carried there by favourable winds or in the course of migratory flights. These species are unlikely to

establish breeding colonies on the island because of the comparative scarcity or total absence of suitable food plants for their larvae.

None of the material collected so far suggests that any subspecific differences have arisen from isolation of the butterfly populations. There is some indication that emergence of adult butterflies may occur slightly later in the season than on the mainland.

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